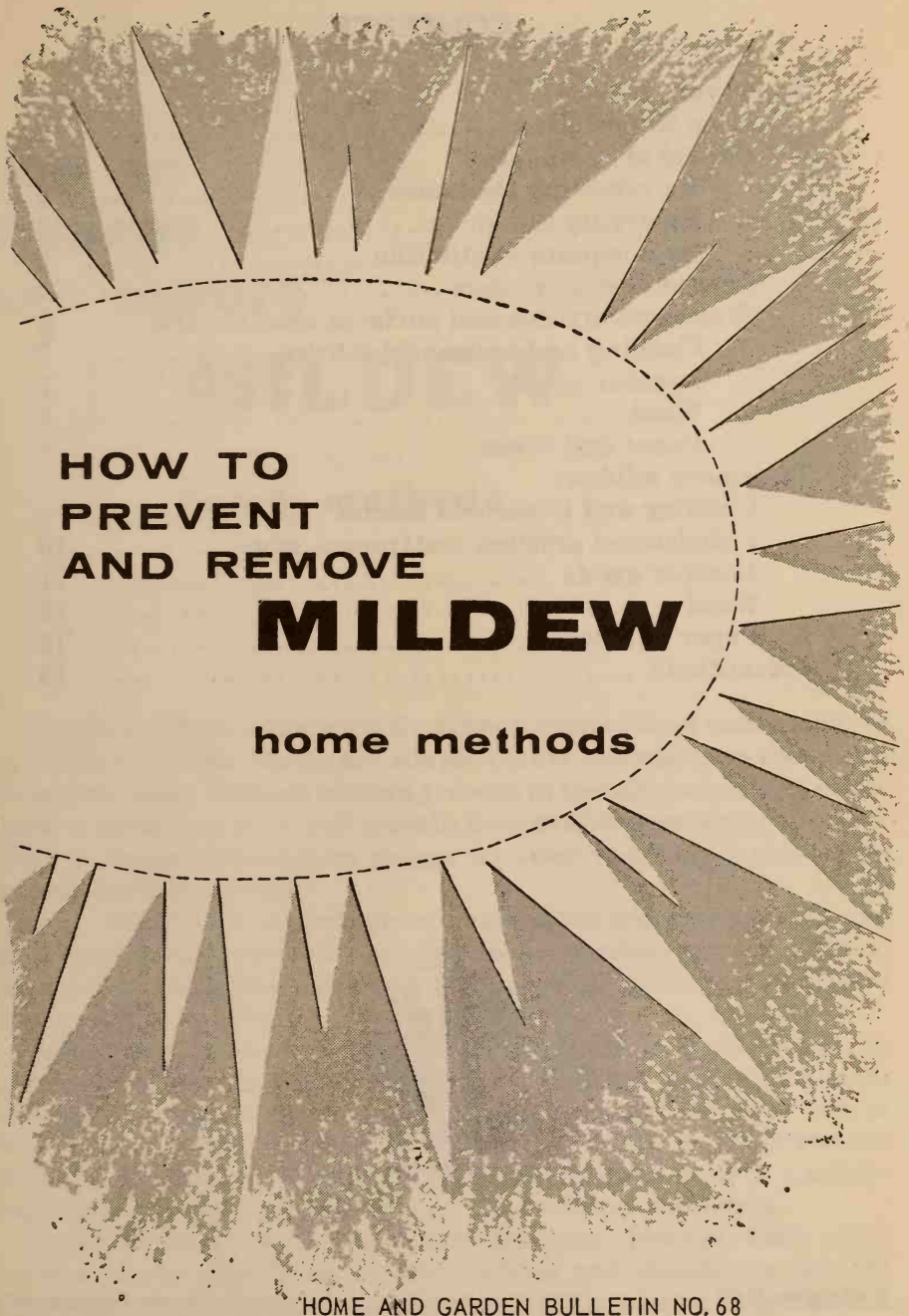

HOW TO PREVENT AND REMOVE MILDEW

home methods

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CONTENTS

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HOW TO PREVENT AND REMOVE MILDEW

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Mildew is a thin, often whitish, growth produced on many kinds of surfaces by molds. Molds are simple plants belonging to the group known as fungi. Though always present in the air, molds that cause mildew need moisture and certain temperatures in order to grow. They commonly develop in muggy summer weather, especially in houses that are closed.

Molds that cause mildew grow on anything from which they can get enough food. In homes they develop most often on cotton, linen, rayon, silk, wool, leather, wood, and paper. Many manmade fibers are resistant to mildew.

Molds that cause mildew flourish wherever it is damp, warm, poorly aired, poorly lighted—in cellars, in crawl spaces of houses without basements, in clothing closets, on draperies and rugs in basement recreation rooms, on shower curtains, on damp clothes rolled up for ironing. These molds are also likely to grow in a newly-built house because of moisture in the building materials.

As the molds grow they cause considerable damage. They often leave a musty odor. They discolor fabrics and sometimes eat into them so severely that the fabrics rot and fall to pieces. They discolor leather and paper.

TO PREVENT MILDEW

Keep Things Clean

Keep closets, dresser drawers, basements, any place where mildew is likely to grow, as clean as possible. Soil on articles can supply sufficient food for mildew to start growing when moisture and temperature are right. Greasy films, such as those that form on kitchen walls, also contain many nutrients for mildew organisms.

Clean clothing is less likely to mildew than soiled clothing. Because most manmade fibers, such as acetate, acrylic, polyester, and nylon are resistant to mildew, clean fabrics of these fibers will not support mold growth. But soil even on these fabrics may supply food to start mildew. Thorough cleaning of all soiled fabrics, regardless of the kind of fiber in them, may help prevent them from mildewing.

Get Rid of Dampness

By removing the cause

Try to control causes of dampness.—Otherwise, mold spores—usually present in the air—settle on articles and have ideal conditions for growth.

Dampness in a basement is often caused by condensation of warm, moist air on cooler surfaces. Excessive moisture may indicate that repairs are needed. Replace cracked or defective mortar. Some basements are continually wet from water leaking through crevices in the wall. Make sure that outside drainage is adequate.

For waterproofing concrete and other masonry walls above ground, apply two coats of cement water paint, tinted with mineral coloring, if desired. Waterproofing treatments to seal absorbent brick and other outside surfaces may be needed.

In crawl spaces under houses, spread a layer of moisture-barrier material over the soil under the building. Heavy roofing paper or polyethylene plastic film can be used.

If your clothes dryer is equipped with a vent, have it exhausted to the outside to prevent condensation of moisture.

By drying the air

Air conditioners and dehumidifiers.—Cool air holds less moisture than warm air. Properly installed air-conditioning systems remove moisture from the air by taking up warm air, cooling it, and circulating the cool air back into the room. In non-air-conditioned homes, and in those having no air-conditioning in the basement, mechanical dehumidifiers are useful. A humidistat can be attached to the unit to control the humidity in a room.

When using air conditioners or dehumidifiers keep windows and doors closed.

Heat.—If necessary, get rid of the dampness by heating the house for a short time. Then open doors and windows to let the moisture-laden air out. An exhaust fan may be used to force it out.

To dry the air in closets and other small areas, an electric light may be burned continuously. The heat will be sufficient to prevent mildew *if the space is not too large. Precaution:* Be sure to place the light bulb at a sufficient distance from clothing to avoid the danger of fire.

Chemicals that absorb moisture.—Silica gel, activated alumina, or calcium chloride may be used to absorb moisture from the air. They are sold in department stores and drugstores and by building-supply dealers, sometimes under various trade names.

Silica gel and activated alumina are not harmful to fabrics. The porous granules remain dry feeling even when saturated—they hold half their weight of water. To use, hang cloth bags of the chemical in clothing closets. Or place an open container of it in the closet—on a shelf preferably, or on the floor. Keep closet doors closed so that moisture from outside air will not get in. You may scatter the dry granules through layers of clothing and other articles that are to be stored in tightly closed chests or trunks.

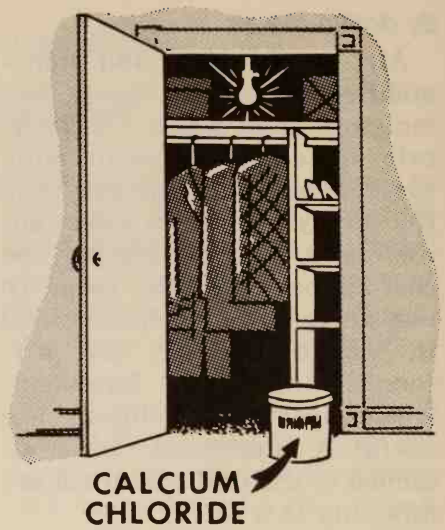
Both silica gel and alumina can be used over and over, if dried between times. To dry, simply place moist granules in a vented oven at 300° F. for several hours. Then put in an airtight box and cool before re-using. Silica gel specially treated with a color indicator is pink when full of moisture, blue when dry.

Calcium chloride also absorbs moisture from the air. It is available both in small white granules of the chemical, and in specially prepared products that employ calcium chloride soaked on a porous claylike material.

Calcium chloride-on-clay products do not drip when saturated; they can be regenerated by driving off the absorbed moisture in an oven. To use one of these products, hang cloth bags that contain it in closets, basements, pantries, or wherever dampness occurs.

Granular calcium chloride holds twice its weight of water. But, as it absorbs moisture it liquefies. Do not let this chemical come in contact with clothing or household textiles; it can make holes in them.

To use granular calcium chloride, put it on a nonrusting screen supported in an enameledware container. Then place the open container in the closet and keep the door shut. When granular calcium chloride becomes liquid replace it with fresh chemical.



By adequate ventilation

Ventilation is the renewing or circulation of air. These air movements are of great importance in removing excess moisture.

When the air outside is drier than that inside, ventilation allows the dry air to enter, take up excess moisture, and be carried outside. When natural breezes are not sufficient, electric fans can be used. They should be of the proper type and size to do a specific job. They may be placed in a window, set in a wall, or ducted to the attic.

Poorly ventilated closets get damp and musty during continued wet weather, and articles stored in them are apt to mildew. Try to improve the ventilation by opening the closet doors to permit natural ventilation, or by installing one of the types of fans mentioned above. In addition, hang the clothes loosely so that air can circulate around them. Dry all clothing wet by rain or perspiration before putting it in the closet.

Cooking, laundering, and bathing may add 2 or more gallons of water to the house within one day unless ventilation is adequate. It is often necessary to use some type of exhaust fan to provide adequate ventilation.

Get Rid of Musty Odors

Musty odors, which indicate mold growth, are sometimes noticeable in such places as basements and shower stalls. Take special precautions to get rid of musty odors as soon as possible; thus, you will prevent further, really objectionable and damaging mold growth. Usually musty odors disappear if the area is well heated and dried. If the odors remain, additional treatments (described in the following paragraphs) may be necessary.

In cellars with dirt floors, use

chlorinated lime (commonly called chloride of lime or bleaching powder) to remove musty odors. Sprinkle this chemical over the floor, let it stay until all mustiness disappears, then sweep it up.

On cement floors and on tiled walls and floors in bathrooms, get rid of mustiness by scrubbing with a dilute solution of sodium hypochlorite or other chlorine bleach available in grocery stores. Use ½ to 1 cup of liquid household bleach to a gallon of water. Rinse with clear water and wipe as dry as possible. Keep windows open until walls and floors are thoroughly dry. *Precaution:* Work quickly and carefully on plastic and asphalt tile to avoid spotting the surface.

Quaternary ammonium compounds (available in janitorial, dairy, and poultry supply houses) may also be used on floors and walls. Select a product that is registered and labeled for the particular use you have in mind. Not all compounds are equally effective.

Aerosol sprays for cleaning and sanitizing bathroom walls are also available.

Some Articles and Surfaces Special Care

Clothing and household fabrics

Keep fabrics dry.—Never let clothing or other fabric articles lie around damp or wet. Dry soiled clothes before putting them into the hamper. Wash out dishcloths and hang them to dry. Spread out washcloths and damp towels. Stretch out wet shower curtains. It is the wet curtain left bunched together or sticking to the wall or tub that is most likely to mildew.

Wash soiled garments and household fabrics in plenty of hot sudsy water; rinse well and dry thoroughly and quickly. Fabrics dried slowly may get sour and musty smelling—a sign of mold growth. When washing musty white cotton materials, add dilute chlorine bleach as directed on the container. (Never use chlorine bleach on silk or wool. Some colored fabrics and some fabrics treated with special finishes may also be affected by chlorine.)

Sprinkle for ironing only as many articles as can be ironed in a day; shake out and dry those not ironed.

To help keep moisture out of clothing and household fabrics and thus make them less susceptible to mold growth, treat them with water-repellent sprays. Use

on draperies, slipcovers, mattresses, golf bags, overshoes, and jackets and other outer garments.

Fungicide products that can be sprayed on fabrics to give them mildew protection are available in low-pressure aerosol containers. Some germicidal, mothproofing, and water-repellent sprays may also give protection against mildew. Read labels on the container for information.

In order to have sufficient chemical on the fabric for mildew protection, wet the surface of the fabric thoroughly with the spray. Unless the sprayed fabrics are kept in a closed container, they should be examined frequently and resprayed. *For precautions on use of pesticides, including fungicides, see page 13.*

Clean before storing.—If clothing or household textiles are not treated with a mildew-resistant finish, be sure to wash or dryclean them before storing, as soiled articles are more likely to mildew than clean ones. And, unless you know that your laundry starch contains an inhibitor, do not leave starch in fabrics to be stored; molds feed on starch finishes.

From time to time on warm, dry days, sun and air articles stored in closets. It pays to inspect occasionally cotton, rayon, leather, and woolen clothing put away in garment bags. Unless such materials are stored with a mildew inhibitor (see below) they may mildew; a closed bag, dampness, and hot summer weather make ideal growing conditions for molds.

Store with mildew inhibitor.—Certain volatile chemicals, the vapors of which inhibit mold growth, may be used to protect fabrics during storage.

One such chemical, paradichlorobenzene, effectively controls mildew on clothing and other apparel when used in packages, trunks, or garment bags kept as nearly airtight as possible. This chemical, which is widely recommended for moth control, is available in grocery and drug stores under various trade names.

Scatter paradichlorobenzene crystals through the folds of garments to be packed in boxes, or hang bags of crystals at the top of garment bags so the heavy vapors settle on the materials being protected. Use about 1 pound of the crystals for 100 cubic feet of air space, proportionately less for smaller spaces. As the vapors leak out, mildew protection disappears and the chemical must be replenished.

Paradichlorobenzene is also available in spray cans.

Precaution: Paradichlorobenzene damages some plastics. Therefore, remove plastic buttons and ornaments from garments and use wooden or metal instead of plastic clothes hangers.

See other precautions on page 13.

Paraformaldehyde is another volatile chemical that has mildew-inhibiting properties. It is sold in powder form at drugstores. Sometimes various sized bags of the chemical are available. Use paraformaldehyde to protect clothing and bedding. Use 3.15 ounces actual paraformaldehyde per 500 cubic feet in a combination formulation of 90.0 percent paraformaldehyde and 10.0 percent paradichlorobenzene. Use 2.35 ounces actual paraformaldehyde per 350 cubic feet in a combination formulation of 50.0 percent paraformaldehyde and 50.0 percent paradichlorobenzene. Place bags of the chemical where the vapors can circulate and reach all surfaces of the stored articles.

Precaution: Paraformaldehyde is poisonous. Avoid inhaling the fumes.

See other precautions on page 13.

Low-pressure sprays containing mildew-inhibiting chemicals also will help control molds and mildew growth in a closed area. To be effective, the spray must wet the interior surfaces of the closet or storage container. Thoroughly spray into cracks and crevices. Respray as frequently as necessary.

Precaution: Do not inhale the mist from the spray and do not use spray near flame. For additional precautions, see page 13. For directions for spraying fabrics, see page 5.

Leather goods

To protect leather against mildew, treat with low-pressure aerosol formulations that carry specific directions. Shoe and luggage stores may have these aerosol sprays that have been formulated especially for leather goods.

Before treating the article, test the spray on a small area where it will not show. Do this to see whether it will change the color of the leather. Repeat the treatment as directed on the label.

Another way to protect leather goods is to apply a good wax dressing. A thin coat of floor wax applied to shoes—to both

the uppers and the soles—keeps moisture out and so helps to prevent mildew. Some commercially available waxes or silicone resins contain anti-mildew properties. Also, some shoe dressings contain anti-fungicidal ingredients that might prove harmful to white or light-colored leather.

During warm, humid weather, protect stored shoes, jackets, luggage, and other leather articles with paradichlorobenzene or paraformaldehyde (p. 6); after treating allow article to dry and then wrap the articles in packages and seal them. If luggage has plastic fittings and hangers, do not use paradichlorobenzene.

Precaution: Do not inhale the mist from the spray and do not use spray near flame. Follow all precautions given on the can. See page 13.

Wood

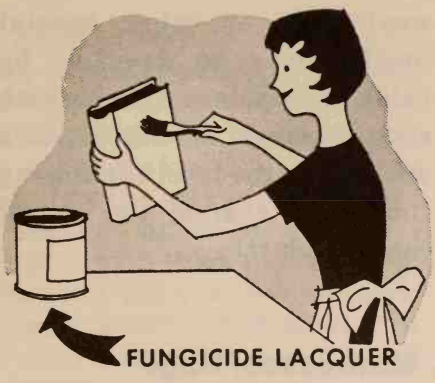
Unpainted.—In damp, warm, poorly ventilated areas, surface mold often develops on wooden parts of buildings. Since new, unseasoned lumber is especially susceptible to mildew it is desirable to avoid its use whenever possible.

Painted.—Indoor wood surfaces covered with enamel or oil-resin paint rarely mildew unless conditions are very favorable to mold growth. Softer paints on outdoor surfaces mildew more readily. Molds feed on the oil and minerals in the paint and cause a dirty-looking discoloration. They may penetrate the paint film deeply, even to the underlying wood.

Mildew-resistant paints in all colors for outdoor wood surfaces are available at paint and hardware stores. The manufacturer has suitably formulated his products with fungicides, such as chlorinated phenols, phenyl mercurials, zinc compounds, or copper compounds, to help combat mildew attack. *Precaution:* Painted surfaces containing chlorinated phenol, phenyl mercuric compounds and other fungicides can be injurious if they reach the mouths of small children. Such mildew resistant paints should, therefore, not be used on such surfaces as window sills, playpens, or toys.

Paper and books

In damp summer weather keep papers and books as dry as possible to help control mold growth. Burn a small electric light continuously in the bookcase, with doors closed as tightly as possible. Or use a chemical dehumidifier, such as silica gel or calcium chloride (see p. 3), in a closed space.



Also effective in preventing mildew are the volatile mildew inhibitors, paradichlorobenzene and paraformaldehyde (p. 6). Hang a bag containing one of these in the closed bookcase. Or dust books and papers with paraformaldehyde, then wrap them in tight packages. Use this chemical sparingly; it is poisonous and may be very irritating to some persons.

Or you may use low-pressure sprays containing a fungicide (p. 5) to protect paper products against mildew. Unless they are kept in a closed container respray them frequently.

TO REMOVE MILDEW

Clothing and Household Fabrics

Remove mildew spots as soon as they are discovered. Don't give the mold growth a chance to weaken or rot the material. Brush off any surface growth outdoors to prevent scattering the mildew spores in the house. Sun and air fabrics thoroughly. If any mildew spots remain, treat washable articles as described below. Dryclean nonwashable articles.

Wash mildew-stained articles at once with soap or detergent and water. Rinse well and dry in the sun. If any stain remains, bleach with lemon juice and salt or use a bleach. Test colored fabrics for colorfastness to the bleach.

Lemon juice and salt.—Moisten stain with a mixture of lemon juice and salt. Spread in the sun to bleach. Rinse thoroughly.

Peroxygen bleach.—Mix 1 to 2 tablespoons of sodium perborate or a powdered bleach containing sodium perborate or potassium monopersulfate with 1 pint of water. Use hot water if safe for the fabric; otherwise use lukewarm water. Sponge stain or soak stained area in the solution. Or sprinkle the dry powder directly on the dampened stain. Let solution or powder remain on the stain 30 minutes or longer, then rinse thoroughly. If mildew stains have been on the fabric for some time, it may be necessary to soak in the bleach solution overnight. If safe for the fabric, the use of sodium perborate solution at or near the boiling point may remove stubborn stains.

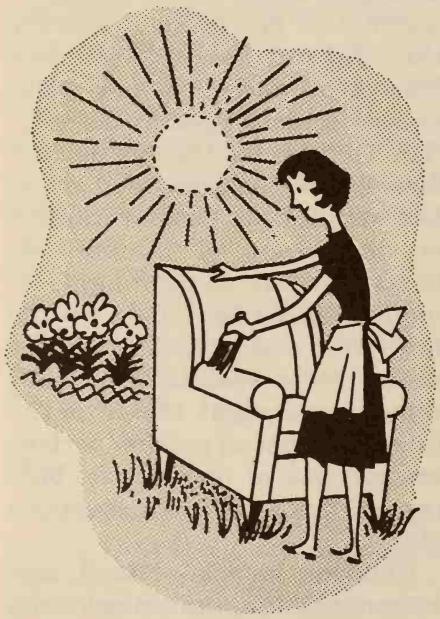
Chlorine bleach.—Mix 2 tablespoons of liquid chlorine bleach

with 1 quart of warm water. Sponge stain or soak stained area in the solution. Allow bleach to remain on fabric from 5 to 15 minutes, then rinse thoroughly. Never use a chlorine bleach on silk, wool, or spandex fabrics. Some fabrics with wash-wear or other special finishes may be damaged by chlorine bleaches. Articles with such finishes should have a warning on the label or hang tag cautioning against the use of chlorine bleach.

Upholstered Articles, Mattresses, Rugs

First remove loose mold from outer coverings of upholstered articles, mattresses, rugs, and carpets by brushing with a broom. Do this outdoors if possible to prevent scattering mildew spores in the house.

Run a vacuum cleaner attachment over the surface of the article to draw out more of the mold. Remember that the mold spores are being drawn into the bag of the vacuum cleaner. If the appliance has a disposable bag, remove and dispose of it immediately. If not, empty the bag carefully (preferably outdoors) in order to avoid scattering mold spores in the house.



Do everything conveniently possible to dry the article—use an electric heater and a fan to carry away moist air. Sun and air the article to stop the mold growth.

If mildew remains on upholstered articles or mattresses, sponge lightly with thick suds of soap or detergent, and wipe with a clean, damp cloth. In doing this, get as little water on the fabric as possible so the filling does not get wet.

Another way to remove mildew on upholstered furniture is to wipe it with a cloth wrung out of dilute alcohol (1 cup denatured or rubbing alcohol to 1 cup water). Dry the article thoroughly.

Sponge mildewed rugs and carpets with thick suds or a rug shampoo. Then remove the suds by wiping with a cloth dampened in clear water. Dry in the sun if possible.

Use a low-pressure spray containing a fungicide (p. 6) to get rid of mildew. Respray frequently, especially in localities where mildew is a major problem.

Vapors of paradichlorobenzene or paraformaldehyde used in closed areas as directed on page 6 will stop mold growth.

If molds have grown into the inner part of an article, send it to a reliable disinfecting and fumigating service. Such services are often listed under "Exterminating and Fumigating" or "Pest Control" services in the classified section of the telephone directory.

Leather Goods

To remove mildew from leather goods, wipe with a cloth wrung out of dilute alcohol (1 cup denatured or rubbing alcohol to 1 cup water). Dry in a current of air. If mildew remains wash with thick suds of a mild soap or detergent, saddle soap, or a soap containing a germicide or fungicide. Then wipe with a damp cloth and dry in an airy place. Polish leather shoes and luggage with a good wax dressing (p. 7).

Shoes contaminated with fungus growth on the inside often develop unpleasant odors, and variously colored growths show on the inner sole and linings and up into the toe. You can remove this kind of mildew with low-pressure sprays especially intended for freshening shoes; these sprays are available at shoe and department stores. Use these products as directed.

Another way to stop mold growth in leather goods is to place the leather goods in a container along with crystals of commercially prepared paradichlorobenzene - paraformaldehyde. Close the container tightly and allow the chemicals to vaporize.

The vapors from these chemicals are effective in killing molds

that have grown into leather, but they give no lasting protection against future contamination. As the vapors leak out, the chemicals must be replaced. Before using the shoes or luggage, air them thoroughly.

Wood

Use heat and improved ventilation to get mildewed wood as dry as possible. Wood that is badly infected may need to be replaced, preferably with wood that has been treated or that is naturally decay resistant.

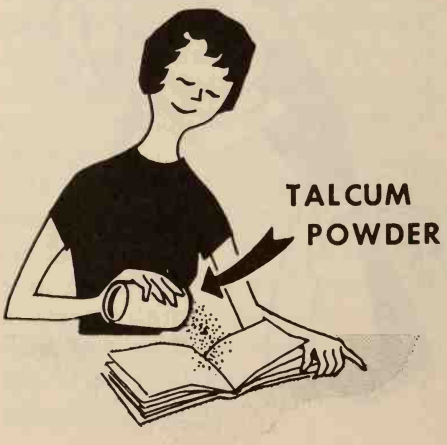
Thoroughly clean mildewed floors, woodwork, and other wooden parts of structures by scrubbing them with a mild alkali, such as washing soda or trisodium phosphate (4 to 6 tablespoons to a gallon of water) or with disinfectants such as a quaternary disinfectant (p. 5) or pentachlorophenate. Paint and grocery stores and janitors' supply houses sell these products under various trade names. Rinse well with clear water and allow the wood to dry thoroughly. Then apply a mildew-resistant paint (see p. 8).

If the mold has grown into the wood under paint or varnish, it may be necessary to scrub the wood first with an abrasive cleaner. Then wash with a solution containing 4 to 6 tablespoons of trisodium phosphate and 1 cup of household chlorine bleach to a gallon of water. Finally, rinse the wood well with clear water. Dry thoroughly and apply a wood preservative before repainting.

Paper and Books

Remove any dry, loose mold from paper with a clean, soft cloth. If mildewed paper is damp, dry it first—in an airy place if possible. To dry wallpaper, heat the room for several hours or days to dry the plaster as well as the paper. Plaster should be dried slowly to prevent it from cracking.

If mildewed paper is washable, wipe it with a cloth wrung out of thick soapsuds, then with clear water. Take care not to wet the paper more than necessary. Do not rub it. Finally pat with a soft, dry cloth. If stains remain, bleach with a solution of a household bleach, then sponge with a cloth wrung out of clear



water. For small stains a commercial ink eradicator may be useful.

Spread pages of books out fanwise to air. If the books are very damp, sprinkle cornstarch or talcum powder between the leaves to take up the moisture. Leave starch or powder on for several hours, then brush off. See suggestions on page 8 for keeping books and papers dry.

Use a mildew inhibitor such as paradichlorobenzene to stop mold growth (p. 6).

PRECAUTIONS

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in original containers—out of reach of children and pets—and away from foodstuff.

Apply pesticides selectively and carefully. Do not apply a pesticide when there is danger of drift to other areas. Avoid prolonged inhalation of a pesticide spray or dust. When applying a pesticide it is advisable that you be fully clothed.

After handling a pesticide, do not eat, drink, or smoke until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Dispose of empty pesticide containers by wrapping them in several layers of newspaper and placing them in your trash can.

NOTE: Registrations of pesticides are under constant review by the U.S. Environmental Protection Agency. Use only pesticides that bear the Federal registration number and carry directions for home and garden use.

More Information

Copies of this publication and those listed below may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, or from any U.S. Government Printing Office bookstore across the country. Write to Superintendent of Documents for price information. Be sure to include your return address and ZIP Code.

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Soaps and Detergents for Home Laundering, G–139.

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